SUBCHAPTER G : END-PRODUCT STANDARDS

§332.71. Sampling and Analysis Requirements for Final Product.

(a) Applicability. Facilities that receive a registration or permit under this chapter, are required to test final product in accordance with this section. Final product derived from municipal sewage sludge at registered facilities is not subject to the requirements of this section, but must comply with the requirements of Chapter 312 of this title (relating to Sludge Use, Disposal, and Transportation).

(b) Analytical methods. Facilities which use analytical methods to characterize their final product must use methods described in the following publications:

(1) Chemical and physical analysis shall utilize:

(A) "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods" (SW-846);

(B) "Methods for Chemical Analysis of Water and Wastes" (EPA-600); or

(C) "Recommended Test Methods for the Examination of Composts and Composting" (Compost Council, 1995).

(2) Analysis of pathogens shall utilize "Standard Methods for the Examination of Water and Wastewater" (Water Pollution Control Federation, latest edition).

(3) Analysis for foreign matter shall utilize "Recommended Test Methods for the Examination of Composts and Composting" (Composting Council, 1995).

(4) Analysis for salinity and pH shall utilize NCR (North Central Regional) Method 14 for Saturated Media Extract (SME) Method contained in "Recommended Test Procedure for Greenhouse Growth Media" North Central Regional Publication Number 221 (Revised), Recommended Chemical Soil Test Procedures, Bulletin Number 49 (Revised), October 1988, pages 34-37.

(5) Analysis of total, fixed and volatile solids shall utilize Method 2540 G (Total, Fixed, and Volatile Solids in Solid and Semi-solid Samples) as described in "Standard Methods for the Examination of Water and Wastewater" (Water Pollution Control Federation, latest edition).

(6) Analysis for maturity shall utilize the reduction of organic matter (ROM) calculation method, as described in the TNRCC "Quality Assurance Program Plan" (QAPP) or a TNRCC approved Quality Assurance/Quality Control (QAQC) plan during the first 18 months of a facility's operation. Reduction in organic matter is calculated by measuring the volatile solids content

at two points in the composting process: when compost feedstocks are initially mixed and when the compost is sampled for end-product testing for total metals and PCBs. For purposes of compost maturity analysis, the effect of the addition and removal of volatile solids and fixed solids to the compost shall be included in the ROM calculation procedure. After the completion of the maturity testing protocol described in subsection (d) of this section, or the facility QAQC plan, or 18 months, which ever comes first, the method recommended in the protocol and approved by the TNRCC shall be utilized.

(c) Sample collection. Sample collection, preservation and analysis shall assure valid and representative results pursuant to an Agency-approved QAQC plan.

(d) Maturity Testing Protocol.

(1) A maturity testing protocol shall be described in the facility QAQC. The protocol shall consist of the ROM method or a comparison of the interim ROM method to a minimum of three test methods with one test method selected from each of subparagraphs (A), (B) and (C) of this paragraph, together with any method in subparagraph (D) of this paragraph:

(A) Chemical analyses:

(i) carbon/nitrogen ratio;

(ii) water soluble ions;

(iii) water soluble organic matter;

(iv) cation exchange capacity;

(v) electrical conductivity;

(vi) crude fiber analysis;

(vii) humification analysis; or

(viii) ratios of the above measurements.

(B) Physical analyses.

(i) Dewar self-heating, or

(ii) color.

(C) Respiration analyses:

(i) CO_2 or

(ii) O_2.

(D) Other test methods proposed in the facility QAQC plan and approved by the TNRCC.

(2) The test methods used in the maturity test protocol shall be based on methodologies published in peer reviewed scientific journals, the publication entitled "Recommended Test Methods for the Examination of Composts and Composting (Compost Council, 1995), or other methods as approved by the TNRCC.

(3) The completed maturity testing protocol shall lead to a recommended maturity testing method(s) capable of classifying compost into maturity grades described in §332.72 of this title (relating to Final Product Grades) and identifying materials which are stable but not mature. The maturity test protocol shall address seasonal variations in compost feedstock and shall be completed within 18 months of the start of a new compost feedstock mixture.

(4) The results of the protocol and recommendations shall be submitted to the TNRCC for review and approval. The basis of the TNRCC review and approval shall be the demonstration that the recommended method adequately classifies compost into maturity classes. The purpose of the TNRCC review and approval is not intended to provide detailed guidance to end users about the agricultural and horticultural compost uses.

(5) The compost maturity protocol does not need to be repeated unless a significantly new compost feedstock recipe is utilized.

(e) Documentation.

(1) Owners or operators of permitted or registered facilities shall record and maintain all of the following information regarding their activities of operation for three years after the final product is shipped off site or upon site closure:

(A) batch numbers identifying the final product sampling batch;

(B) the quantities, types and sources of feedstocks received and the dates received;

(C) the quantity and final product grade assigned described in §332.72 of this title;

(D) the date of sampling; and

(E) all analytical data used to characterize the final product, including laboratory quality assurance/quality control data.

(2) The following records shall be maintained on-site permanently or until site closure:

(A) sampling plan and procedures;

(B) training and certification records of staff; and

(C) maturity protocol test results.

(3) Records shall be available for inspection by TNRCC representatives during normal business hours.

(4) The executive director may at any time request by registered or certified mail that a generator submit copies of all documentation listed in paragraph (1) of this subsection for auditing the final product grade. Documentation requested under this section shall be submitted within ten working days of receipt of the request.

(f) Sampling Frequencies.

(1) Registered facilities. For those facilities which are required to register, all final product on-site must be sampled and assigned a final product grade set forth in §330.72 of this title (relating to Final Product Grades) at a minimum rate of one sample for every 5,000 cubic yard batch of final product or annually, whichever is more frequent. Each sample will be a composite of nine grab samples as discussed in subsection (g) of this section.

(2) Permitted facilities. For facilities requiring a permit, all final product on-site must be sampled and assigned a final product grade set forth in §330.72 of this title at a minimum rate of one sample for every 3,000 cubic yard batch of final product or monthly whichever is more frequent. Each sample will be a composite of nine grab samples as discussed in subsection (g) of this section.

(3) Alternative testing frequency. One year after the initiation of final product testing in accordance with this section, an operator of a registered or permitted facility may submit to the executive director a request for an alternative testing frequency. The request shall include a minimum of 12 consecutive months of final product test results for the parameters set forth in subsection (h) of this section. The executive director will review the request and determine if an alternative frequency is appropriate.

(g) Sampling requirements. For facilities subject to sampling and analysis, the operator shall utilize the protocol in the TNRCC QAPP or a TNRCC approved facility QAQC plan shall be followed. The executive director may at any time request that split samples be provided to an agency representative. Specific sampling requirements which must be satisfied include:

(1) Sampling from stockpiles. One third of the grab samples shall be taken from the base of the stockpile (at least 12 inches into the pile at ground level), one third from the exposed surface and one third from a depth of two feet from the exposed surface of the stockpile.

(2) Sampling from conveyors. Sampling times shall be selected randomly at frequencies which provide the same number of subsamples per volume of finished product as is required in subsection (d) of this section.

(A) If samples are taken from a conveyor belt, the belt shall be stopped at that time. Sampling shall be done along the entire width and depth of the belt.

(B) If samples are taken as the material falls from the end of a conveyor, the conveyor does not need to be stopped. Free-falling samples need to be taken to minimize the bias created as larger particles segregate or heavier particles sink to the bottom as the belt moves. In order to minimize sampling bias, the sample container shall be moved in the shape of a "D" under the falling product to be sampled. The flat portion of the "D" shall be perpendicular to the beltline. The circular portion of the "D" shall be accomplished to return the sampling container to the starting point in a manner so that no product to be sampled is included.

(h) Analytical Requirements. Final product subject to the sampling requirements of this section will be tested for all of the following parameters. The executive director may at any time request that additional parameters be tested. These parameters are intended to address public health and environmental protection.

(1) total metals, to include:

(A) Arsenic;

(B) Cadmium;

(C) Chromium;

(D) Copper;

(E) Lead;

(F) Mercury;

(G) Molybdenum;

(H) Nickel;

(I) Selenium; and

(J) Zinc.

(2) Maturity/Stability by reduction in organic matter on an interim basis and by approved method of maturity/stability analysis after the completion of the maturity/stability method protocol as described in subsections (b) and (d) of this section.

(3) weight percent of foreign matter, dry weight basis.

(4) pH by the saturated media extract method.

(5) salinity by the saturated media extract electrical conductivity method.

(6) pathogens:

(A) salmonella; and

(B) fecal coliform.

(7) Polychlorinated-biphenyls (PCBs) - required only for permitted facilities.

(i) Data Precision and Accuracy. Analytical data quality shall be established by EPA standard laboratory practices to ensure precision and accuracy.

(j) Reporting Requirements.

(1) Facilities requiring registration must report the following information to the executive director on a semi-annual basis for each sampling batch of final product. Facilities requiring a permit must report similarly but on a monthly basis. Reports must include, but may not be limited to all of the following information:

(A) batch numbers identifying the final product sampling batch;

(B) the quantities, types and sources of feedstocks received and the dates received;

(C) the quantity of final product and final product standard code assigned;

(D) the final product grade or permit number of the disposal facility receiving the final product if it is not Grade 1 or Grade 2 Compost as established in §332.72 of this title (relating to Final Product Grades);

(E) all analytical results used to characterize the final product including laboratory quality assurance/quality control data and chain-of-custody documentation; and

(F) the date of sampling.

(2) Reports must be submitted to the executive director within two months after the reporting period ends.

Adopted November 1, 1995 Effective November 29, 1995

§332.72. Final Product Grades.

(a) Applicability. Facilities that receive a registration or permit under this chapter, are required to test final product in accordance with this section. Final product derived from municipal sewage sludge at registered facilities is not subject to the requirements of this section, but must comply with the requirements of Chapter 312 of this title (relating to Sludge Use, Disposal, and Transportation).

(b) Grades. Compost material that has undergone the composting process and is ready for distribution shall be considered final product, and shall be classified with one of the following grade names:

(1) Grade 1 Compost;

(2) Grade 2 Compost;

(3) Waste Grade Compost.

(c) Final product testing. Final product shall be regularly tested pursuant to §332.71 of this title (relating to Sampling and Analysis Requirements for Final Product) to determine the product's grade. Testing of final product and interpretation of test results shall be conducted in accordance with the Texas Natural Resource Conservation Commission's current Quality Assurance Program Plan, or, in the case of facilities with TNRCC permits or registrations, the Quality Assurance Quality Control Plan specified in the facility's permit.

(d) Final product classification. Final product shall be classified according to the following classification system:

(1) Grade 1 Compost. To be considered Grade 1 Compost, the final product must meet all of the following criteria:

(A) Shall contain no foreign matter of a size or shape that can cause human or animal injury;

(B) Shall not exceed all Maximum Allowable Concentrations for Grade 1 Compost in Table 1 of this section; (Figure 1: 30 TAC 332.72(d)(1)(B))

Figure 1: 30 TAC 332.72

Table 1: Maximum Allowable Concentrations

PARAMETER	Grade 1 Compost (mg/kg)	Grade 2 Compost (mg/kg)
As	10	41
Cd	16	39
Cr (total)	180	1200
Cu	1020	1500
Pb	300	300
Hg	11	17
Mo	75	75
Ni	160	420
Se	36	36
Zn	2190	2800
PCBs	1	10

(C) Shall not contain foreign matter in quantities which cumulatively are greater than 1.5% dry weight on a 4mm screen;

(D) Shall meet the requirements of cured compost as described in Table 2 of this section; (Figure 2: 30 TAC 332.72(d)(1)(D))

Figure 2: 30 TAC 332.72

Table 2: Maturity and Stability Standards.

METHOD	SEMI-MATURE COMPOST	MATURE COMPOST	CURED COMPOST
Reduction of Organic Matter (ROM) (%)	Between 20% and than 60% 40%	Between 40% and 60%	Greater
Other Methods	Maturity Protocol	Maturity Protocol	Maturity Protocol

(E) Shall meet the requirements for pathogen reduction for Grade 1 Compost as described in Table 3 of this section; (Figure 3: 30 TAC 332.72(d)(1)(E)) and

Figure 3: 30 TAC 332.72

Table 3: Additional Final Product Standards.

PARAMETER	Grade 1 Compost	Grade 2 Compost
Salinity (mmhos/cm) <sup>1<\sup>10	10	
pH<sup>1<\sup>	5.0 to 8.5	5.0 to 8.5
Pathogens: Fecal Coliform	less than 1,000 MPN per gram of solid or meets PFRP	geometric mean density less than 2,000,000 MPN per gram of solids or meets PSRP
Salmonella	less than 3 MPN per 4 grams total solid or meets PFRP	No value

<sup>1<\sup> A higher conductivity or pH outside the indicated range may be appropriate if the compost is specified for a special use.

(F) Shall meet the requirements for salinity and pH for Grade 1 Compost as described in Table 3 of this section. (Figure 3: 30 TAC 332.72(d)(1)(E)).

(2) Grade 2 Compost:

(A) Shall contain no foreign matter of a size or shape that can cause human or animal injury;

(B) Shall not exceed all Maximum Allowable Concentrations for Grade 2 Compost in Table 1 of this section at a compost organic matter content which is equivalent to a mature compost when maturity is determined by reduction in organic matter during the interim period or a maturity test which is part of an approved maturity test protocol; (Figure 1: 30 TAC 332.72(d)(1)(B))

(C) Shall not contain foreign matter in quantities which cumulatively are greater than 1.5% dry weight on a 4mm screen;

(D) Shall meet the requirements of semi-mature compost, mature compost or cured compost as described in Table 2 of this section; (Figure 2: 30 TAC 332.72(d)(1)(D))

(E) Shall meet the requirements for pathogen reduction for Grade 2 Compost as described in Table 3 of this section; and (Figure 3: 30 TAC 332.72(d)(1)(E))

(F) Shall meet the requirements for salinity and pH for Grade 2 Compost as described in Table 3 of this section. (Figure 3: 30 TAC 332.72(d)(1)(E))

(3) Waste Grade Compost:

(A) Exceeds any one of the Maximum Allowable Concentrations for Grade 2 final product in Table 1 of this section, and (Figure 1: 30 TAC 332.72(d)(1)(B))

(B) Does not meet the other requirements of Grade 1 or Grade 2 Compost.

(e) Maturity adjustment. Compost which is semi-mature or mature shall have the metal concentrations adjusted to reflect the metal concentration which would occur if the compost met the criteria for a cured compost as described in Table 2, "Maturity and Stability Standards". (Figure 2: 30 TAC 332.72(d)(1)(D))

(f) Waste grade final product. Any material which does not meet the final product standards shall be appropriately disposed at a permitted municipal solid waste facility.

§332.73. Allowable Uses of Final Product by Grade.

(a) Applicability. Facilities that receive a registration or permit under this chapter, are required to test final product in accordance with this section. Final product derived from municipal sewage sludge at registered facilities is not subject to the requirements of this section, but must comply with the requirements of Chapter 312 of this title (relating to Sludge Use, Disposal, and Transportation).

(b) Distribution. Distribution and use of final product shall be in accordance with the following restrictions:

(1) Grade 1 Compost. There are no restrictions on the use of Grade 1 compost.

(2) Grade 2 Compost. Grade 2 compost shall not be used at a residence or licensed child-care facility.

Adopted November 1, 1995 Effective November 29, 1995

§332.74. Compost Labelling Requirements.

(a) Applicability. Facilities that receive a registration or permit under this chapter, are required to test final product in accordance with this section. Final product derived from municipal sewage sludge at registered facilities is not subject to the requirements of this section, but must comply with the requirements of Chapter 312 of this title (relating to Sludge Use, Disposal, and Transportation).

(b) Label information. All compost distributed within Texas derived from feedstock identified in the registration and permit tiers in §332.3 of this title (relating to Applicability) shall be clearly labelled according to the following requirements. The label information must be grouped together and plainly printed in English and Spanish.

(1) Labels and vouchers. Compost distributed in containers shall have a label attached to or on the face of the container. Vouchers which provide the same information as required on labels shall be given to persons receiving compost distributed in bulk; and

(2) Labels/vouchers information. The label or voucher shall include the information described in subparagraphs (A) or (B) of this paragraph.

(A) General statement.

(i) Grade 1 Compost. This product is considered Grade 1 Compost and meets the requirements and standards described in 30 Texas Administrative Code, §332.72 and has unrestricted use.

(ii) Grade 2 Compost. This product is considered Grade 2 Compost and meets the requirements and standards 30 Texas Administrative Code, §332.72 and cannot be used at a residence or licensed child-care facility.

(B) Feedstocks. Specify the feedstock or feedstocks from which the compost was derived. When two or more feedstocks are used, the label or voucher shall indicate each feedstock used in descending order or predominance by wet weight. For purposes of specifying feedstocks for this labelling requirement, water added to composting materials shall not be considered a feedstock. The label shall identify one or more of the following general descriptions of feedstock:

(i) source-separated organic materials;

(ii) source-separated meat, fish, chicken, oils, or greases;

(iii) municipal sewage sludge;

(iv) organic materials derived from a positive sort of mixed municipal solid waste;

(v) grease trap waste;

(vi) disposable diapers;

(vii) the sludge byproduct of paper production; and

(viii) mixed municipal solid waste.

(C) Incorporation into soil. The label shall state that it is recommended that compost be mixed into the top 15 centimeters of soil.

Adopted November 1, 1995 Effective November 29, 1995

§332.75. Out of State Production.

Any compost produced outside of the State of Texas, which is distributed within Texas, shall be labeled pursuant to §332.74 of this title (relating to Final Product Labelling Requirements).

Adopted November 1, 1995 Effective November 29, 1995

Adoption of §§332.71-332.75
Date Adopted: November 1, 1995
Date Filed with the Secretary of State: November 6, 1995
Date Published in the Texas Register: November 21, 1995
Date Effective: November 29, 1995